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GEOLOGIC AND MINERAL AND WATER RESOURCES INVESTIGATIONS IN WESTERN COLORADO, USING SKYLAB EREP DATA

Monthly Progress Report

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EREP Investigation 380

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INTRODUCTION

The primary objective of the CSM Skylab Program is to analyze EREP data for geologic information. To this end, the research has been subdivided into the following tasks;

Task I. The PI shall assist NASA/MSC in mission planning activities related to the proposed investigation.

Task II. The investigator will screen all EREP data obtained over Colorado and will select frames for detailed study.

Task III. The investigator will prepare photogeologic maps using selected S-190 photographs, and will analyze them to determine what geologic information may be contained in them.

Task IV. The geological interpretations obtained in Task 3 will be compared to interpretations obtained from S-192 imagery, and to interpretations made from ERTS-I imagery.

Task V. The geological interpretations will be verified by means of interpretation of aerial photographs, published geological reports, and field observations.

Task VI. The investigator will prepare recommendations for the optimum type, scale, and resolution of imagery to be used for studies of regional geology and exploration for mineral deposits and water resources.

Progress

Overall Status

The progress of the research is as anticipated.

Past Month's Activity

Acknowledgement was received from NASA of the three abstracts for technical papers submitted for the Earth Resources Survey Symposium in June. It was requested by NASA that these three abstracts be combined into one, and that the three presentations be given as one coherent presentation. Efforts during the past month have been directed toward accomplishing this.

The research on the application of Skylab photography for indications of mineral deposits in central Colorado was brought to an end during this reporting period. The results of this research formed a Master of Science thesis, which was successfully defended during the reporting period. During the next reporting period, this research will be converted into a CSM remote sensing report, which should be ready for publication in May. The results of this research will also be presented at the NASA Earth Resources Survey Symposium in Houston in June.

Research continued on the structural geologic investigations in the central Colorado test site, covering the southern Front Range, Rampart Range, and South Park. The research phase of this investigation has been finished; present efforts are directed toward the Skylab final report and a presentation of the results also at the NASA Earth Resources Survey Symposium

Three days were spent in the field near Moab, Utah field checking photogeologic interpretations of Skylab photography. This field checking consisted of ground evaluation of (1) normal stratigraphic sequences, (2) areas whose photointerpretation suggested

that they were critical areas to the geologic interpretation of the region, and (3) those areas that were structurally too complex to interpret on the photography. In general, the field work affirmed the enthusiasm previously expressed with the geologic information content of the Skylab photos.

The status of the photogeologic interpretation of Skylab photos in southwestern Colorado - southeastern Utah is as follows: photointerpretation of an "unknown" area has been completed. Interpretation was conducted using S190B color stereo photographs at original scales. Geologic interpretations were annotated on 1:500,000 scale photo enlargements and this information was transferred to topographic maps at 1:250,000. Two subsidiary areas were chosen within the larger "unknown" area. One of these areas was annotated onto 1:250,000 scale photographic prints and the information transferred to a topographic map at 1:62,500. The second subsidiary area was annotated onto photo prints at 1:125,000 and transferred to topo maps at 1:62,500. Three days were spent field checking these interpretations. Continued work on this phase of the research will consist of comparing photogeologic interpretation results with published geologic sources of information and considerable field checking during the summer.

During the report period, analyses of the capability of a photointerpreter to detect lithologic contacts on ERTS-1 and Skylab S190-A images were completed. These analyses are now being interpreted in terms of best overall band, best overall image set, most easily detected contact, best band for each contact and best image set for each contact. Comparisons are being made between detectabilities on ERTS-1 and Skylab S190-A images.

Planned Activities for Current Month

Research in May will consist mostly of report writing and preparation of presentations for the Earth Resources Survey Symposium.

Travel

Travel in March-April consisted of one trip by the Principal Investigator to the Moab, Utah, area for geologic field work.

No travel is scheduled for May, although some local field work may be conducted.

Outlook and Recommendation

Progress continues to be satisfactory, and the project should be completed on schedule (revised).

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